

## ABSTRACTS

*This section of the JOURNAL is published in collaboration with the two abstracting Journals, ABSTRACTS OF WORLD MEDICINE and OPHTHALMIC LITERATURE, published by the British Medical Association. The abstracts are divided into the following sections: Syphilis (Clinical, Therapy, Serology, Pathology, Experimental), Gonorrhoea, Non-Gonococcal Urethritis and Allied Conditions, Chemotherapy, Public Health and Social Aspects, Miscellaneous. After each subsection of abstracts follows a list of articles that have been noted but not abstracted. All subsections will not necessarily be represented in each issue.*

### SYPHILIS (Clinical)

**Prognosis of Cardiovascular Syphilis.** GRIMBLE, A. *Guy's Hosp. Rep.*, 104, 239. 2 figs, 41 refs.

After a comprehensive review of the literature on cardiovascular syphilis, especially of reports concerning prognosis and the value of specific therapy, a study is presented of 164 cases (143 males and 21 females) seen at Guy's Hospital, London, between 1925 and 1944. Of the 164 patients, 92 were given organic arsenicals intravenously while 72 did not receive antisyphilitic treatment. None was given antibiotics.

The cause of death in almost all instances was cardiac or pulmonary disease; twelve patients died from ruptured aneurysm. Post-mortem examination was carried out in 36 of the 164 cases. In retrospect it was found extremely difficult to grade the size of the heart or the degree of cardiac failure, but it is of interest that pain in the chest occurred in just over one-half of the 145 patients in whom the duration of symptoms could be accurately ascertained. The average age of the patients in this series was 54 years (31 to 71), those with aneurysm in both treated and untreated groups being on the average 4 years older than those with valvular disease. The mean expectation of life was 2 to 4 years, with a maximum of 12 years; this is in close agreement with the findings of other workers. Treatment with organic arsenicals increased the expectation of life after the onset of symptoms from 32 to 51 months; this also is in line with the findings of others. The results of specific therapy were best "in the younger patients, more strikingly in those with valvular disorder, than those with aneurysm". G. L. M. McElligott

**Changes in the Optic Nerve in the Course of Syphilis of the Central Nervous System.** (In Czech.) MOLCAN, J. (1955). *Neurol. Psychiat. Csl.*, 18, 154.

In 32 out of 85 patients with cerebrospinal syphilis pathological changes were found in the fundus. Primary atrophy of the optic nerve was observed in four of nine patients with tabes dorsalis. Practical blindness developed in 3 years. Blindness with simple optic atrophy was found in one out of four patients with taboparalysis. One case of simple atrophy, due to opticochiasmal arachnoiditis, was observed in the meningo-vascular form of syphilis. Another case of early stage of papilloedema was healed by antisyphilitic treatment. Oedema

in the nasal sectors of the disc with paracentral scotoma was observed in a patient with asymptomatic neurosyphilis. One case of simple atrophy of the disc, seven cases of partial atrophy, and four cases of slight papilloedema were observed in the group of 52 patients with progressive paralysis. No personal points of view are expressed. M. Klima

**Importance of Fundus Changes for the Diagnosis of Latent Syphilis.** (Bedeutung der Augenhintergrundveränderungen in der Diagnostik von Lues latens.) PALICH-SZANTO, O., and VALER, M. (1955). *Klin. Mbl. Augenheilk.*, 127, 207. 7 tables. 38 refs.

Among 219 patients with latent syphilis eighty had fundus changes previously described. The disk is of normal colour, not elevated, but the margins are somewhat blurred, especially on the nasal side. There is a peripapillary oedema and sheathing of some of the vessels on and near the disk. The authors believe that these fundus changes have a diagnostic importance. F. C. Blodi

**Miosis in Argyll Robertson Syndrome and Related Pupillary Disorders.** LOWENSTEIN, O. (1956). *A.M.A. Arch. Ophthalm.*, 55, 356. 2 tables, 12 figs, 7 refs.

The author discusses and classifies the causes and mechanism of miosis. Three groups are distinguishable:

- (a) damage in the sympathetic pathways to the dilator pupillae muscle;
- (b) damage to the supra-nuclear inhibition pathways to the Edinger-Westphal nucleus;
- (c) parasympathetic spasm.

It is shown that the Argyll Robertson and related syndromes belong to the final category. P. Jameson Evans

**Untreated Syphilis in the Male Negro. Background and Current Status of Patients in the Tuskegee Study.** SCHUMAN, S. H., OLANSKY, S., RIVERS, E., SMITH, C. A., and RAMBO, D. S. (1955). *J. chron. Dis.*, 2, 543. 5 figs, 10 refs.

The Tuskegee study of untreated acquired syphilis, which was started in 1932 amongst male negroes with a uniformly low standard of living in a rural area of Alabama, is, and presumably will remain, unique. The present article surveys the status of the study after 20

years and reviews the difficulties encountered in endeavouring to follow the original patients' progress from diagnosis to necropsy. A remarkable degree of success has been achieved, and only 10 per cent. of the syphilitic individuals and 9 per cent. of the non-syphilitic control subjects have been lost to observation. Of the original 408 syphilitic individuals, 51 per cent. are living and 39 per cent. are dead. Of 192 non-syphilitic controls, 65 per cent. are living and 26 per cent. are dead. One of the features so far made obvious is the higher mortality rate amongst the syphilitic men in all age groups, though the difference in mortality rates decreases in the elderly, where the effect of diseases of old age makes itself noticeable.

Since the inception of the study, some of the syphilitic group have received antisyphilitic treatment. Moreover, it was expected that a high proportion of the men might have been given antibiotics for non-specific complaints. This, however, was not borne out by investigation, only 27.5 per cent. of the syphilitic and 32.6 per cent. of the non-syphilitic group having received penicillin in varying amounts. Suggested explanations for these low figures are put forward. The survivors of the syphilitic group are now 70 per cent. untreated, 22.5 per cent. inadequately treated, and 7.5 per cent. adequately treated.

The report is intended to provide a basis for the more detailed results of the 20-year study to be presented subsequently.

Leslie Watt

#### Neuro Relapse in Early Syphilis after Penicillin Therapy.

RAJAM, R. V., and RANGIAH, P. N. (1955). *Indian J. Derm. Venereol.*, 21, 183. 1 ref.

#### Study of General Paresis with Special Reference to the Reasons for the Admission of These Patients to Hospital.

[In English.] FROSHAUG, H., and YTREHUS, A. (1956). *Acta psychiat. scand.*, 31, 35. 4 figs, 21 refs.

**Some Difficulties in the Diagnosis of the Primary Chancre in Mixed Infections with Syphilis and Lymphogranulomatosis.** (Algunas dificultades diagnósticas del chancro de inoculación en las infecciones mixtas sifilítico-linfo-granulomatosas.) GARCÍA-SERRANO, E. DE GREGORIO. (1956). *Clin. y Lab.*, 61, 196. 3 figs.

**Incidence of Malaria, Syphilis, and Brucellosis in Neoplastic Diseases of the Blood and Reticulo-endothelial System.** (Incidenza della malaria, della lue e della brucellosi nelle emopatie produttive e nelle neoplasie del S.R.E.) BILE, G., and MANES, L. (1956). *Progr. med. (Napoli)*, 12, 97. 17 refs.

**Relapse in Early Syphilis.** RAJIMWALE, D. B. (1956). *Antiseptic*, 53, 195. 1 ref.

**Syphilis is Still Here.** CRANDELL, C. A., MELVIN, D., and ABRAHAM, A. (1956). *J. med. Soc. N.J.*, 53, 118.

**Bibliography of Internal Medicine: Syphilis. Part I: From John Hunter to Discovery of the Treponeme [1905].** BLOOMFIELD, A. L. (1956). *Stanford med. Bull.*, 14, 1. Bibl.

#### SYPHILIS (Therapy)

**Fate of 294 Pregnant Syphilitic Women Treated Entirely before Conception.** (Das Schicksal von 294 Graviditätenluetischer, ausschliesslich vor der Konzeption anti-luetisch behandelter Mutter.) GUMPESBERGER, G. (1956). *Derm. Wschr.*, 133, 189. 25 refs.

At the University Dermatological and Venereological Clinic, Vienna, 294 pregnant women who had been treated for syphilis before conception were studied. In 45 cases penicillin was the primary therapeutic agent, and in the remaining 249 arsenic and bismuth only had been used. Of the latter group, 143 patients were considered to have had insufficient treatment—that is, less than 2 courses of combined metallothérapie in the early stages or less than 5 courses in the later ones. Whereas none of the mothers who had been treated with penicillin gave birth to infected infants, twelve of those treated with arsenic and bismuth did so, two of whom had been regarded as adequately treated. All those mothers who were sero-negative at the time of labour gave birth to healthy infants.

G. W. Csonka

**Congenital Syphilis and Antenatal Prophylaxis in Leipzig in 1947-54.** (Lues connata und pränatale Prophylaxe 1947 bis 1954 in Leipzig.) TUTZKE, D. (1956). *Off. Gesundh.-Dienst.*, 17, 713. 1 fig., 12 refs.

The author, writing from the Institute of Social Hygiene, University of Leipzig, contends that at the present time special attention should be given to the prophylaxis of congenital syphilis, since this form of the disease must be regarded as one of the potential after-effects of the large number of infections incurred during and immediately after the war. In East Germany all the necessary measures, such as routine blood-testing of all pregnant women and the prophylactic treatment of those with evidence of syphilis can be legally enforced, and ration cards for the additional foods allowed during pregnancy are issued only to women who attend antenatal clinics.

Out of 43,540 pregnant women whose blood was tested during the period 1950-4, 1,107 (2.54 per cent.) were found to be infected with syphilis, but on account of the measures taken only 25 of the children borne by these women had signs of congenital syphilis. In the author's opinion the principal reasons why cases of congenital syphilis still occur in spite of these measures are: non-attendance of pregnant mothers at antenatal clinics, errors in interpretation of the results of the blood tests, and false results of these tests arising from errors of technique in their performance. The number of new cases of congenital syphilis, however, is decreasing steadily; for example, eleven such cases were seen in 1950, but only one in 1954.

A. Fessler

**Dangers of Congenital Syphilis and Their Avoidance.** (Gefahren der angeborenen Lues und ihre Verhütung.) OEHME, J. (1956). *Dtsch. med. Wschr.*, 81, 159. 18 refs.

A total of 66 infants with clinical signs of congenital syphilis were admitted to the Children's Clinic of the University of Leipzig during the period 1949-53. Of

the mothers of these children, 18 per cent. were known to have syphilis but had received insufficient treatment during pregnancy, 14 per cent. received no treatment although they were known to be infected, and the remainder were not treated, either because no blood test had been carried out or because the results of such tests had been wrongly interpreted or had been incorrect as a result of faulty technique. An analysis of the case histories of 1,334 syphilitic mothers, 200 of whom had received no treatment either before or during pregnancy, showed that the best results are to be expected with treatment given during the second trimester of pregnancy. Altogether 269 of the children of these women were syphilitic, 198 of these being borne by untreated mothers. In contrast, all the 420 women who had been treated during pregnancy gave birth to healthy children who remained healthy while under observation for periods up to 4 years. The remaining 714 women had been treated before, but not during pregnancy.

It is suggested that every woman who has once been infected with syphilis should be given a "prophylactic course" of penicillin (12 mega units) during each subsequent pregnancy, irrespective of the amount of treatment she has already received, of the results of blood tests (32 syphilitic children in the above series were born of sero-negative mothers), and of the condition of her previous children. In addition, it is recommended that the children of syphilitic mothers who have not been treated adequately during pregnancy should be given a "preventive" course of penicillin (600,000 units per kg. body weight). The author admits, however, that these recommendations are subject to modification when the results of the treatment of syphilis with penicillin are more fully known.

A. Fessler

**Terramycin in the Treatment of Early Syphilis.** (La terramicina en el tratamiento de la sífilis precoz.) IRANZO PRIETO, V. (1955). *Act. dermo-sifiliogr. (Madr.)*, 47, 24. 4 refs.

The author, working at the Clinic for Social Hygiene and Dermatology, Algeciras, describes the results of treatment with "terramycin" (oxytetracycline) in ten cases of syphilis—six of the primary disease, two secondary, one seroresistant, and one of tertiary syphilis associated with lymphogranuloma venereum. The drug was given to a total dosage of 10 g. by mouth (250 mg. 6-hrly) except in one case of primary syphilis, in which 12 g. was given, and the case of tertiary syphilis with lymphogranuloma venereum, in which a total of 24 g. in three separate courses was administered.

The result of dark-ground examination, which was repeated every 12 hrs, became negative in between 24 and 48 hrs in six and in 60 hrs in the remaining one of the seven cases from which treponemes were recovered initially. There were no Herxheimer reactions and the clinical response was good. Serological reactions remained negative in the six cases of primary syphilis during observation for 45 days to 5 months; in the two cases of secondary syphilis they had become negative in 43 days from the start of treatment in one case and in 32 days in

the other, and remained negative during 5 months of observation.

[The treponemicidal action of oxytetracycline, which is weaker and possibly less constant than that of penicillin, is again confirmed; but the follow-up period in the series reported is short.]

Eric Dunlop

**Effect of Topical Cortisone in the Treatment of Syphilitic Interstitial Keratitis.** ABBOUD, I. (1955). *Bull. ophthalm. Soc. Egypt*, 49 (Session 52), 113.

The treatment of syphilitic interstitial keratitis with cortisone and penicillin reduces the period of illness and promptly relieves symptoms. An illustrative case is described in a 10-year-old child who was also given bismuth. The corneae cleared up and within 3 months visual acuity in the right eye improved from hand movements to 6/12 and the left eye from 4/60 to 6/9.

M. A. H. Attiah

**Does Treatment with Vitamin B<sub>1</sub> Influence Sero-resistant Syphilis?** [In English.] ANTONEN, V. M., and HEIKINHEIMO, H. (1955). *Ann. Med. exp. Biol. Fenn.*, 33, 372. 3 refs.

**Combined Treatment with Chlorpromazine and Specific Therapy in G.P.I.** (Considerations sur le traitement par la chlorpromazine associée à la thérapeutique spécifique dans la P.G.) BERTHIER, C., BONNERU-COUCHOUD, M., and BARNAUD, J. (1956). *J. Med. Lyon*, 37, 293.

**Report of One Year's Experience in Syphilis Control in Bassein, Burma.** ISAACSON, S., and DEV, R. (1956). *Indian J. Derm. Venereol.*, 22, 15. 2 figs, 5 refs.

## SYPHILIS (Serology)

**New Complément-fixation Technique in the Serology of Syphilis.** (Nouvelle technique de fixation du complément dans la sérologie de la syphilis.) ROULIN, G. M. P. (1955). *Bull. Wld Hlth Org.*, 13, 887. 9 refs.

The author describes a complement-fixation technique for the diagnosis of syphilis, developed at the Lille Military Hospital, which combines features of the Calmette-Massol and Kolmer methods. The complement dosage is kept fixed at 0.2 and 0.3 ml. of a 1:40 dilution of guinea-pig serum, 0.1 ml. of the serum under test and 0.1 ml. of diluted cardioliipin antigen completing the test mixture. Incubation is for 22 to 23 hrs at 6 to 8° C., followed by 30 to 35 min. at 37° C. Haemolysin is titrated in the presence of 0.2 ml. of 1:40 complement, and a 5 per cent. cell suspension sensitized with 3.5 M.H.D. of haemolysin is used in the test. [Very full details of the technique are given in the original paper.] By cutting down the amount of complement the author claims to have considerably raised the sensitivity of the test.

In tests carried out in parallel with the Meinicke, Kahn, Kolmer, and VDRL tube tests on 1,700 sera sent for routine examination the author's technique gave isolated positive reactions in nineteen instances. These included six cases of known and six of possible syphilis, four cases in which no clinical history was available, and three cases

in which there was no evidence pointing to syphilis. [The author's assumption that a positive reaction was specific if any one (or more) of the other reactions was also positive is perhaps open to question.]

Sensitivity was assessed by tests on syphilitic sera in parallel with the Meinicke, standard Kahn, VDRL tube, and Kolmer tests, in which the same antigen was used as in the author's test. With the exception of the Meinicke the author's test was considerably more sensitive than the others. In a series of quantitative tests it gave higher titres than either the VDRL tube test or the Kolmer test with cardiolipin.

A. E. Wilkinson

**Demonstration of Antibodies in the Serological Diagnosis of Syphilis.** (Zur Frage des Antikörpernachweises in der serologischen Lues-Diagnostik.) PÖTEL, J. (1955). *Z. Immunforsch.*, 112, 393. 19 refs.

In a study carried out at the University Institute of Hygiene, Halle, sera from 28 patients with proven syphilitic infections, in which such complement-fixation and flocculation reactions as the Meinicke and Citachol reactions were positive, were then tested with cardiolipin and pallida antigens. Some were also tested with spirochaetal agglutination antigen and two by means of the treponemal immobilization test. The results of these cross-tests are presented in a series of tables and details of the techniques used, including absorption tests, are described.

From these studies the author concludes that the pallida reaction, used as a complement-fixation test, and the spirochaetal agglutination reaction demonstrate the same antibodies in serum, but that the cardiolipin reaction—as a special form of the Wassermann reaction—and the pallida reaction show different antibodies. Quantitative differences between the cardiolipin and pallida reactions are therefore to be expected.

R. D. Catterall

**Statistical Study of Autodeviation of Complement in the Bordet-Wassermann Reaction.** (Recherches statistiques sur l'autodeviation du complement dans la reaction de Bordet-Wassermann.) ADÉ, G., and BRUN, R. (1955). *Dermatologica (Basle)*, 111, 366. 1 fig., 33 refs.

The authors present an analysis of the anticomplementary (AC) Wassermann reactions observed at the University Dermatological Clinic, Geneva, between July, 1947, and December, 1953. During this period 104,071 sera from various sources were examined according to the "classic" technique [no details given] by the same personnel. Among these, 334 AC sera were found, the over-all incidence being 0.32 per cent and the incidence in different years varying between 0.18 and 0.47 per cent. As it was not practicable to determine the age and sex of every patient whose serum had been tested, the composition of this population was estimated from a sample survey of 1,000 consecutive sera. Similar sample surveys of the patients tested during the years in which the incidence of AC reactions varied most widely showed no significant difference in age or sex distribution between them.

The 334 AC sera came from 273 patients (22 newborn infants, two older children, and 249 adults). The incidence of AC reactions in newborn infants was especially high (7.1 per cent.), but no opinion is expressed whether this is due to an intrinsic property of such sera or to poor technique in their collection. The incidence in adults over 50 was considerably higher (0.41 per cent.) than in adults below this age (0.14 per cent.). Sex apparently had no effect on the overall incidence, but it was noted that AC reactions were predominantly in sera from males in some years and from females in others. The presence of syphilis had a definite effect, 0.3 per cent. of non-syphilitic sera giving AC reactions compared with 4 per cent. of sera from syphilitics. [The latter figure seems unduly high.]

The number of AC reactions occurring in each batch of sera tested did not appear to be dependent on the particular batches of sheep cells and complements used. Insufficient data were available to evaluate the possible effect of differences in the batch of amboceptor used. Small variations in the temperature at which sera were inactivated did not appear to influence the results.

The incidence of AC reactions among 3,436 specimens of cerebrospinal fluid tested during the period under review was 0.77 per cent.

A. E. Wilkinson

**Serological Findings in Leprosy and Tuberculosis with the Wassermann, Meinicke, and VDRL Tests.** RUGE, H. (1955). *Bull. Wld Hlth Org.*, 13, 861. 35 refs.

During a venereal disease survey carried out by the World Health Organization in Egypt, sera from 820 lepers and 720 patients with tuberculosis were subjected to the Kolmer Wassermann reaction using cardiolipin antigen (W.R.), the Meinicke test, and the VDRL slide test. The incidence of syphilis in the general population was found to be 2 to 4 per cent., and it was estimated that between 2 and 4 per cent. of all positive or doubtful reactions were probably non-specific in nature.

Among the 820 sera from cases of leprosy, mostly from inmates of a leper colony and some from patients attending out-patient clinics, there were 234 positive reactions; sixteen of these patients had a history of syphilis and a further fifteen were considered to be syphilitic on the grounds that positive reactions were obtained with all or most of the tests used. [This assumption may be open to question.] In 25 per cent. of cases the reactions were thought to be non-specific. These were commonest in the cutaneous and mixed forms of the disease (25 to 50 per cent.) and least frequent in neural leprosy (10 per cent.). The Meinicke test was the most specific of those used and the VDRL test the least specific, while the WR occupied an intermediate position. Of 521 sera from lepers whose clinical histories were known, 5.4 per cent. of the reactions were anti-complementary, these being more common in males than females. In contrast only 0.9 per cent. of 25,000 sera examined during the general survey gave anti-complementary results.

Sera were tested from 592 patients with pulmonary tuberculosis and from 128 with tuberculosis of bone. There were 75 positive reactions; eight of these patients had a history of syphilis, while a further 29 were considered to be syphilitic on serological grounds. Thus 5

per cent. of the whole group were thought to give non-specific reactions. In contrast to the findings in leprosy, the VDRL test had the highest specificity, followed by the Meinicke test and the WR.

Discrepancies were fewer and less marked between the results of the three tests on the sera from the tuberculous patients than on those from lepers, the pattern of the reactions being more uniform. Quantitative VDRL tests were performed on all sera reactive to the slide test. With one exception sera giving titres greater than 1:4 also gave positive Wassermann and Meinicke reactions. [The serological results are analysed in great detail; they do not lend themselves to presentation in abstract form.]

A. E. Wilkinson

**Comparison of Antilipoidal, Group Antitreponemal, and Immobilizing Antibodies in the Rabbit Inoculated with *Treponema pallidum*.** (Epoca di comparse degli anticorpi antilipoidici, antitreponemici di gruppo e immobilizzanti nel coniglio inoculato con *Treponema pallidum*.) DARDANONI, L. (1955). *Riv. Ist. sieroter. ital.*, 30, 414. 7 refs.

In a study carried out at the Institute of Hygiene and Microbiology, University of Palermo, the author has investigated the production of antibodies in experimental syphilis, using rabbits infected by intratesticular inoculation with the Nichols strain of *Treponema pallidum*. Samples of serum from the 25 animals were examined by means of complement-fixation tests, using purified treponemal antigen and cardiolipin antigen, and for immobilizing antibody by the treponemal immobilization test of Nelson and Mayer.

At the beginning of the syphilitic orchitis antilipoidal and group antitreponemal antibodies, but not immobilizing antibodies, were usually present. A dissociated response sometimes occurred, in which there was early development of group antitreponemal antibodies but delay in the appearance of antilipoidal and immobilizing antibodies until after the development of orchitis. An early serological response, with the appearance of group antitreponemal antibodies, was noted 24 to 72 hrs after inoculation.

Eric Dunlop

**Results and Observations on Nelson and Mayer's *Treponema pallidum* Immobilization [T.P.I.] Test in Syphilis in Man. III. Reproducibility of the T.P.I. Test.** (Risultati ed osservazioni sul test di immobilizzazione del *Treponema pallidum* secondo Nelson e Mayer (T.P.I. test) nella sifilide umana. Nota III<sup>a</sup>: Riproducibilità del T.P.I. test.) BELLONE, A. G., and BONELLI, M. (1955). *G. ital. Derm. Sif.*, 96, 698. 12 refs.

Writing from the Dermatological Clinic, University of Milan, the authors first briefly review the scanty literature dealing with the reproducibility of the treponemal immobilization test. In order to obtain further information they have carried out repeat tests on 74 samples of serum, following the technique employed at the State Serum Institute, Copenhagen, in which the results are read twice, at 18 and at 42 hrs. They confirm that the later reading is often clear-cut when the earlier one has been doubtful.

Of the 74 sera, 25 gave a definitely positive reaction and twenty a definitely negative reaction at the first test, and in all of these an identical result was obtained on repetition. Of 29 initially doubtful reactions, seven were positive, seventeen negative, and five remained doubtful on repetition of the test, further testing giving the same result.

To test the reliability of serial examinations on the same patient, 101 tests were carried out on 42 patients. The only changes observed on repetition of the test were that two initially doubtful reactions became negative. The serum of two patients was found to be "toxic" or treponemicidal. This, it is stated, could not have been due to previous penicillin therapy since penicillinase was added to every sample of serum tested, but may have been the result of chemical contamination of the syringe or the test tube. A false negative reaction may be due to a deficiency in complement, while a positive result obtained on repeating a test formerly giving a doubtful result may be due to a low immobilizing titre together with a low sensitivity in the first test. On the other hand a relatively hypersensitive test may give a doubtful result which is negative on repetition. The authors state that a certain variation in the sensitivity of the test does occur, as can be seen when serum from the same patient is examined serially over any length of time.

F. Hillman

**Immunologic Studies with Fractions of Virulent *Treponema pallidum*. I. Preparation of an Antigen by Desoxycholate Extraction and Its Uses in Complement Fixation.** PORTNOY, J., and MAGNUSON, H. J. (1955). *J. Immunol.*, 75, 348. 1 fig., 19 refs.

The preparation of a complement-fixing antigen at the laboratory of the U.S. Public Health Service at the University of North Carolina from treponemes obtained from the testes of rabbits inoculated with the virulent Nichols strain of *Treponema pallidum* is described. After washing, the treponemes are extracted with acetone and ether and then dried *in vacuo*. The dried powder is extracted with 0.2 per cent. sodium desoxycholate in citrate-saline. The resulting solution, after further purification by dialysis and centrifugation, constitutes the antigen. [The extraction technique is complicated, and the original paper must be consulted for details.] Enough antigen to test about fifty sera by a micro-Kolmer complement-fixation technique can be obtained from one rabbit. The antigen was found not to be anticomplementary even when used in the undiluted state, but the optimum titre was found to be 1:5. Rabbits treated with cortisone yielded more potent antigens than untreated animals. The antigens were stable for at least 2 months when stored at  $-20^{\circ}\text{C}$ .

Absorption and inhibition tests showed that the antibody reacting with the complement-fixing antigen was distinct from reagin, immobilizing antibody, and the treponemal agglutinating antibody which is absorbed by lipoidal antigen, but it had a possible relationship with the non-reagin agglutinating antibody described by McLeod and Stokes (*Publ. Hlth Rep. (Wash.)*, 1955, 70, 379; *Abstr. Wld Med.*, 1955, 18, 461). No fixation was

obtained with an antiserum prepared against the cultured Reiter treponeme. Desoxycholate extracts of the Reiter organism failed to fix complement in the presence of human or rabbit syphilitic sera, although they did so with the homologous antiserum.

In tests on 556 human sera from various sources it was found that the treponemal complement-fixing test gave more positive reactions with sera from patients with early syphilis than the treponemal immobilization (TPI) test, while the reverse was true in latent and late syphilis. [These results were obtained with rather small numbers of cases.] In experimental syphilis in rabbits, also, complement-fixing antibody appeared before immobilizing antibody. There was 98 per cent. agreement with the results of the TPI test on sera from 49 patients whose sera had given presumed non-specific positive serological reactions, suggesting that the complement-fixation test may have a high specificity. It also showed good reproducibility.

A. E. Wilkinson

**Observations on the Sensitivity of the Haemolytic System in Complement-fixation Tests.** RICE, H. M. (1956). *J. clin. Path.*, **9**, 66. 2 figs, 7 refs.

The effect of the age of the sensitized cell suspension on the serum titre determined by the quantitative White-chapel Wassermann technique has been investigated by the author at Nottingham General Hospital. Three cell suspensions were used: "new", in the preparation of which the sheep-cell-amboceptor mixtures were kept at 37° C. for 30 minutes before use; "old", in the preparation of which the fresh suspensions were left at room temperature for 5 to 6 hrs before use; and "split", in the preparation of which, after the addition of amboceptor to cells, the mixtures were kept at 4° C. for 5 to 6 hrs and then at 37° C. for 30 min. before use. "New" suspensions were used for the complement titrations.

Quantitative tests were performed in parallel on 400 sera with "new" and "old" cell suspensions. In 138 cases a higher titre was obtained with "new" cells; in 115 of these the difference was only of one tube, which is within the limits of technical variation, but 23 sera (5.75 per cent.) gave titres 4 to 16 times greater with the "new" cells than with the "old". Only 33 sera gave higher titres with "old" cells, and the difference was never greater than one dilution. A comparison of "new" with "split" cell suspensions in parallel tests on 250 sera showed a similar pattern of results, while in simultaneous tests on the same sera with "split" and "old" cell suspensions 57 sera gave higher titres with "split" cells (48 with a one-tube difference and nine with a 2-tube difference), and 48 sera gave higher titres with "old" than with "split" cells (45 with a one-tube difference and three with a 2-tube difference). Higher titres were also obtained with "new" than with "old" cell suspensions in quantitative gonococcal complement-fixation tests. Complement titrations carried out in parallel with "new" and "old" cell suspensions showed that while the titre was not affected, the end-points were not so clear-cut with "old" cells as with "new". Parallel quantitative tests showed that agitation of the suspension during

sensitization by bubbling air through it had no effect on the performance of the haemolytic system.

The author concludes that sensitized cell suspensions show an increased susceptibility to lysis after standing, and that to obtain reproducible results in quantitative complement-fixation tests using optimal-proportion techniques it is essential to use a fresh preparation.

A. E. Wilkinson

**Third Generation Syphilis in an Infant with Serotests Indicating Passively Transferred Maternal Reagents.** [In English]. SUNDAL, A., and VOGELSANG, T. M. (1956). *Acta paediat. (Uppsala)*, **45**, 161. 3 figs, 8 refs.

**District of Columbia Blood-testing Survey for Syphilis in Selected Industries and Trades.** TAGGART, R., MORGAN, T., and PENDLETON, J. (1956). *Med. Ann. Distr. Columbia*, **25**, 73.

**Coloured Cardiolipin Antigen for the Serodiagnosis of Syphilis.** (Un antigeno cardiolipina tenido para el serodiagnóstico de la sífilis.) RAPPAPORT, F., and STARK, G. J. (1956). *Laboratorio (Granada)*, **21**, 275. 10 refs.

**Cardiolipin Antigen. Nephelometric Measurements 3.** [In English]. REYN, A., HARTMANN, J., and SCHMIDT, H. (1956). *Acta. path. microbiol. scand.*, **38**, 211. 3 figs, 8 refs.

**Significance at the Present Time of the Diagnosis of Biologic False Positive Reaction.** MILLER, J. L. (1956). *J. Louisiana med. Soc.*, **108**, 113. 1 fig., 9 refs.

**Comparative Study of Rapid and Overnight Meinicke Tests.** KHAN, S. A. (1956). *Pakistan J. Hlth*, **5**, 45. 1 fig.

**Can the Wassermann Reaction be Truly Positive in the Cerebrospinal Fluid Only?** (Esiste veramente una reazione di wassermann positiva da sola sul liquor?) NISTRI, M. (1955). *Acta neurol. (Napoli)*, **10**, 862. 2 figs, 49 refs.

**Studies on Treponemal Immobilization Test. I. Survival Test of *Treponema pallidum*.** MATSUI S., and FUKAWA, E. (1955). *Jap. J. med. Sci. Biol.*, **8**, 1. 1 fig., 28 refs.

**Antigenic Structure of Pathogenic Strains of *Treponema pallidum*.** (Sobre la estructura antigenica del treponema pallidum patogeno.) DARDANONI, L. (1956). *Laboratorio (Granada)*, **21**, 241. 23 refs.

**Treponemal Antigens and the Immobilization Test.** DICKMAN, A. (1956). *J. med. Soc. N.J.*, **53**, 174.

***Treponema pallidum* Complement-Fixation Test.** MAGNUSON, H. J., and PORTNOY, J. (1956). *Amer. J. publ. Hlth*, **46**, 190. 4 figs, 4 refs.

**Studies on the Metabolism of the Treponemata. II. Transamination in the Reiter Treponeme.** BARBAN, S. (1956). *J. Bact.*, **71**, 274. 12 refs.

**Serology in Syphilis and Yaws.** IBARRA, L. M. (1955). *J. Philipp. med. Ass.*, **31**, 697. 17 refs.

**Syphilis. Serological Interpretation. Prognosis and Rapid Treatment.** (Sifilis. Interpretacion serologica. Pronostico y tratamiento rapido.) FLEISCHMAJER, R. (1955). *Pren. med. argent.*, **42**, 3281. 27 refs.

### SYPHILIS (Pathology)

**Studies in the Neurohistology of the Peripheral Vegetative Nerves of the Skin in Various Chronic Infectious Granulomata, with Special Reference to the Langerhans Cells. II. Tertiary Syphilis of the Skin.** (Studien zur Neurohistologie der nervösen vegetativen Peripherie der Haut bei verschiedenen chronischen infektiösen Granulomen mit besonderer Berücksichtigung der Langerhansschen Zellen. II. Tertiäre Syphilide der Haut.) RICHTER, R. (1956). *Arch. klin. exp. Derm.*, **202**, 496. 14 figs, 16 refs.

### GONORRHOEA

**Has the Incubation Period of Gonorrhoea Undergone a Change?** LODIN, A. (1955). *Acta derm.-venereol. (Stockh.)*, **35**, 457. 1 fig., 5 refs.

There is some support in recent literature for the view that since the introduction of sulphonamides and penicillin in the treatment of venereal disease the gonococcus has become attenuated and the incubation period of gonorrhoea has become longer. The author, working at Karolinska Institutet and Garnisonssjukhuset, Stockholm, has compared the incubation period of gonorrhoea in 1,120 young males during three different periods:

- (1) the years 1932 and 1933 when topical treatment was given;
- (2) the years 1942 and 1943 when sulphonamides were administered as a routine;
- (3) the one-year period 1954-5 during which penicillin was given.

Up to 1943 the average incubation period was 5 days; in 1954-5 it was 6 days. A scatter diagram shows a uniform peak at 3 days in all the years. Approximately 90 per cent. of the subjects became ill within the first 9 days, but whereas formerly the incubation period exceeded 14 days in only 1 per cent. of patients it now exceeded 14 days in 6 to 7 per cent. The interval between the appearance of the first symptoms and the time when advice was sought was 1·8 days in 1932 and 3·9 days in 1954-5. This, in conjunction with the longer incubation period, is taken as evidence of the comparative mildness of the early symptoms and the decreased virulence of the gonococcus. Treatment with sulphonamides and with penicillin has possibly been a causative factor in this attenuation.

F. Hillman

**Penicillin Therapy of Gonorrhoea.** (Zur Penicillintherapie der Gonorrhoe.) DRESSLER, H., and GUMPESBERGER, G. (1955). *Z. Haut- u. GeschlKr.*, **19**, 242. 24 refs.

Unlike that of early syphilis, the incidence of gonorrhoea has not been materially reduced since 1951. The emergence of penicillin-resistant gonococci has been suggested to account for this phenomenon, but none of the many investigations so far has produced any convincing evidence.

The authors of the present paper analyse the effect of 3,500 courses of penicillin on 3,186 patients with gonorrhoea treated at the University Venereal Diseases Clinic, Vienna, between 1946 and 1954. There was no evidence of an increase in the number of relapses over these years, 202 cases in the present series being classed as relapses and a further 110 as reinfections.

The treatment schedules for primary infections and relapses varied, but it was thought that 4 injections each of 50,000 units aqueous penicillin at 3-hrly intervals gave the best results in all groups. Nevertheless, 10·8 per cent. of the relapsed cases failed to respond to this therapy (but their further fate is not discussed in detail). Only six cases were fully investigated for evidence of penicillin resistance, but none was found. The reason for the continued persistence of gonorrhoea in spite of effective methods of treatment is thought to lie in the increasing failure to detect the sources of infection. Lately, the proportion of men being infected by unknown partners has risen to over 50 per cent. in the authors' clinic and they urge that new methods to deal with this side of the problem should be considered.

[At least one case of penicillin-resistant gonorrhoea has recently come to the abstractor's notice and it is felt that vigilance is definitely called for in order to detect such cases early and thus prevent the dissemination of drug-resistant organisms.]

G. W. Csonka

**Prophylaxis of Ophthalmia Neonatorum with Quaternary Ammonium Compounds.** (Die Prophylaxe der Neugeborenenblennorrhoe mit quärtären Ammoniumverbindungen.) SIEBECK, R., and WALCH, E. (1956). *Dtsch. med. Wschr.*, **81**, 70. 1 fig., 24 refs.

Writing from the University of Heidelberg the authors first list the common objections to the routine use of silver nitrate as a prophylaxis against ophthalmia neonatorum; in their view the sulphonamides are also ruled out because of the increasing incidence of resistant strains of gonococci, while penicillin appears unsuitable for various reasons. However, a non-irritant substance with a wide antibacterial spectrum, which is stable on storage, diffuses readily, and is free from the disadvantages of antibiotics, was found among the quaternary ammonium compounds. The substance used, "quartamon", has been successfully employed in a series of 1,875 intraocular operations as an anti-infective agent. Its antibacterial action was tested by a tube method in concentrations of 0·01, 0·05, 0·1, and 0·5 per cent. against *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas pyocyanea*, and *Gonococcus*, and also by a disk method with subcultures from the zones of growth inhibition. Concentrations above 0·05 per cent. were 100 per

cent. effective against gonococci; it was also shown that up to 5 minutes after instillation of a 0.5 per cent. solution of quartamon into the conjunctival sac of the rabbit a bactericidal concentration of the compound was maintained. No irritant effect was noted.

On the strength of these tests one drop of quartamon in the 0.5 per cent. solution was instilled into each eye of 100 newborn babies and 24 hrs later a swab was taken from both eyes. Irritant effects such as lacrimation and mild conjunctival reddening occurred in eight cases, while 10 per cent. of the infants showed a mild conjunctival leucocytosis—compared with the usual 20 per cent. of those treated with silver nitrate. Pathogenic organisms were identified in four cases; one mild case of ophthalmia was due to a haemolytic staphylococcus. Subsequently quartamon was used in a further series of 250 newborn infants. Mild irritation was noted in twelve cases and organisms were found in six, two cases of non-gonococcal ophthalmia occurred. In one case the mother of a healthy baby was found to suffer from active gonorrhoea; yet the baby remained free from infection although only a single drop of quartamon had been instilled.

F. Hillman

**Is Crede's Blennorrhoeic Prophylaxis Still Justified?** (Hat die Credesche Blennorrhoe-prophylaxe noch ihre Berechtigung?) ZIMMER, K., and KREMSER, R. (1955). *Geburts. u. Frauenheilk.*, 15, 628. 1 table.

In a series of 665 newly-born infants no ocular prophylactic treatment was used; suppurating conjunctivitis was seen in 45 per cent. as compared with 20 per cent. seen in infants given Crede's prophylaxis. In the latter group the infection was much milder.

M. H. T. Yuille

#### NON-GONOCOCCAL URETHRITIS AND ALLIED CONDITIONS

**Keratoderma Blennorrhagica with Reiter's Disease.** [In Finnish.] SEIRO, J. (1955). *Duodecim (Helsinki)*, 71, 436.

A 39-year-old man had three periods of abacterial urethritis and polyarthritis in nine years. In the two last attacks he had eruptions resembling keratoderma blennorrhagica. In the last period the conjunctiva and lower part of the cornea showed small punctate infiltrations. The secretion of tears was markedly diminished and the clinical picture seemed to be that of keratoconjunctivitis sicca.

G. von Bahr

**Non-specific Urethritis. A Problem of Management Rather than of Repeated Antibiotics.** KERSHAW, P. S., and LINDSAY, J. G. (1956). *J. roy. Army med. Cps*, 102, 56.

The authors describe the management of 378 previously untreated cases of non-gonococcal urethritis seen at a British military treatment centre in Japan. The treatment consisted in giving 1 g. streptomycin by injection plus 2g. sulphadiazine at once followed by 1 g. every 4 hrs to a total of 32 g. A sodium citrate

mixture and abundant fluids were also given. At the end of 3 months seventy patients had relapsed, a relapse rate of 18.5 per cent.; there was no significant difference in the relapse rate between fresh cases and cases occurring after gonorrhoea. Of the seventy cases of relapse, the cause was considered to be indulgence in alcohol in 22, "manual trauma" in thirteen, fresh exposure in three, and unknown in 32. If those due to "known" causes were excluded the relapse rate was only 8.5 per cent. In 75 further cases, divided into three groups each of 25, one group was treated with the regimen described above, one with 5.5 g. oxytetracycline over 5 days, and the third with 8.5 g. aureomycin over 5½ days. The failure rates in the three groups were 19, 36, and 25 per cent. respectively. The importance is stressed of the patient's avoiding alcohol and of refraining from "milking the urethra" (which apparently patients often do to ascertain if the discharge has ceased). The cooperation of the patient is thus required, and antibiotics alone are not enough.

[If non-gonococcal urethritis is an infectious disease the causes of failure mentioned above must be precipitating rather than actual; relapse can result only if the patient is not in fact cured.]

R. R. Willcox

**Pleuropneumonia-like Organisms in Reiter's Disease and in Related Syndromes.** (Pleuropneumonia-like organism bei Morbus Reiter und verwandten Syndromen.) KRUCKEN, H., and FABRY, H. (1955). *Arztl. Wschr.*, 10, 294. 1 fig., 67 refs.

A discussion of the findings in the urethro-oculo-synovial syndromes.

M. H. T. Yuille

**Transmission of *Trichomonas vaginalis* in the Eye of Animals.** KEAN, B. H., and WELD, J. T. (1955). *Proc. Soc. exp. Biol. (N.Y.)*, 89, 218. 1 Table., 3 refs.

Transmission and serial passage of *Trichomonas vaginalis* in the anterior chamber of the rabbit is reported.

J. R. Hudson

#### CHEMOTHERAPY

**Recent Studies on Albomycin, a New Antibiotic.** GAUSE, G. F. (1955). *Brit. med. J.*, 2, 1177. 3 figs, 16 refs.

The author describes some recent studies carried out on albomycin at the Institute for Antibiotic Research (Academy of Medical Sciences), Moscow. Albomycin, a cyclic iron-containing peptide, was first isolated by the author with Brazhnikova in 1951 from cultures of the streptomycete *Actinomyces subsp. tropicus*. It strongly inhibits the growth of a variety of Gram-negative and Gram-positive organisms, and is particularly effective *in vitro* and *in vivo* against staphylococci which have proved resistant to other antibiotics. The pure drug has been shown to be about ten times more potent than penicillin. It forms a reversible complex with serum proteins and is non-toxic in animals and man after subcutaneous, intravenous, and intrathecal injection. It has proved effective in the treatment of pneumonia and, given intrathecally, of pneumococcal meningitis, particularly in



children; it has also been of value in a variety of surgical infections and in cases of prostatitis and gonococcal urethritis resistant to penicillin. *F. W. Chattaway*

**Penicillin V: Further Observations.** MARTIN, W. J., NICHOLS, D. R., and HEILMAN, F. R. (1955). *Proc. Mayo Clin.*, 30, 521. 2 refs.

The authors have investigated, at the Mayo Clinic, the diffusion into various body fluids and tissues and the concentration in the serum of penicillin V (phenoxy-methyl penicillin) when administered orally in doses up to 1,000,000 units. The antibiotic was shown to be readily absorbed and to diffuse into ascitic and pleural fluids and thyroid tissue, but not into the cerebrospinal fluid in the absence of meningeal inflammation. It was found that when it was given together with probenecid the serum level of the antibiotic after 2 hrs was higher than when it was given alone. Penicillin V is concentrated in the liver and excreted in the bile in a biologically active form. Details of the concentration of the drug in the various tissues investigated are given in a series of tables. *F. W. Chattaway*

**Effects of Antibiotic Therapy on the Clinical and Epidemiological Aspects of the Venereal Diseases.** (La therapie antibiotique et ses effets sur la clinique et l'épidémiologie des maladies vénériennes.) RICCIARDI, L., (1956). *Brux.-med.*, 36, 645.

### MISCELLANEOUS

**Serological Study of Yaws in Thailand.** D'MELLO, J. M. F., and KRAG, P. (1955). *Bull. Wld Hlth Org.*, 13, 1003. 4 figs, 4 refs.

The authors report the results of the VDRL test in 6,000 untreated and treated cases of yaws in all its stages seen during an anti-yaws campaign in Thailand in 1951-3, and discuss the value of serology in conducting such a mass treatment campaign, basing their conclusions on the serological examination of 3,632 individuals.

In early untreated cases of yaws (Type I) a strong degree of positivity was commonly obtained irrespective of the age of patient, 97.5 per cent. of sera giving a positive reaction up to a dilution of 1 in 256. In the next stage (Type II)—manifested by palmar and/or plantar hyperkeratosis—a somewhat lower level of sero-positivity was found, 18 per cent. of 544 cases giving a negative result. On analysis by age groups it became clear that at this stage of the disease the serological reaction in the younger age groups is invariably positive, and strongly so. Later on, in a number of cases, the disease may "burn out" and the reaction become negative; this group probably also included a proportion of non-yaws cases in which the hyperkeratosis was due to the rough work in the fields. In any case, the hyperkeratosis of yaws is an active progressive lesion with slow regressive tendencies, as is shown by the high reagin levels in the majority of cases. Of the next stage (Type III), manifested by ulcerative lesions, only 84 cases were seen; as eleven of these were

seronegative they were considered to be examples of mistaken diagnosis. There were 342 cases of Type IV (bone and joint lesions or pains) and of these 25.7 per cent. gave a negative reaction; some of these were probably also cases of "burnt-out" disease and some non-yaws cases. Once again the younger age groups showed the highest positive titres, there being with advancing years a steady decline towards a negative reaction. In the large group of some 1,500 cases of latent yaws (Type V) the reagin level was generally low (as in Type IV).

The serological response to treatment with procaine benzylpenicillin and aluminium monostearate (P.A.M.) showed that high titres may decrease rapidly in the first 6 months, but further decreases were slow. Sero-negativity at the end of one year was obtained in only 11.4 per cent. of cases, the best response being obtained in cases of Types I, II, and V. Only 0.3 per cent. of the cases showed a slight increase in titre one year after treatment, and in the absence of clinical yaws such an increase is within the limits of technical variation of the test. There was little difference between the serological response to two injections at 3 days' interval of either 1.2 mega units or 600,000 units P.A.M., and that to 1.2 mega units P.A.M. given as a single injection.

[It is impossible to do justice in an abstract to this extensive study, and interested readers are referred to the original.] *G. W. Csonka*

**Venereal Disease in Prostitutes Treated at the Hospital do Desterro, Lisbon.** (Venereologia nas meretrizes assistidas no Hospital do Desterro.) SAMPAIO, M., and CHAVES, M. (1955). *Trab. Soc. port. Derm. Vener.*, 13, 255.

During the 10 years ending October, 1955, 3,866 prostitutes were admitted to the Hospital do Desterro, Lisbon, the annual admission rate varying between 310 and 459. Until 1948 the number of registered prostitutes admitted outnumbered that of the *clandestinas*. After 1949 there was a marked fall in the number of registered prostitutes as a result of a law passed that year forbidding fresh registrations or the opening of new brothels; at the same time there was a big increase in the number of clandestine prostitutes admitted. The authors detail the venereal infections found in 235 prostitutes during the year ending October, 1955, the routine tests carried out on each patient including serological tests for syphilis, smears and cultures for gonorrhoea, and vaginal smears for *Trichomonas vaginalis* and *Monilia*. Early syphilis was found in thirteen cases (5.5 per cent.), latent syphilis in 60 (25.5 per cent.), "gonococcal vulvovaginitis" in 82 (34.8 per cent.), trichomonal vaginitis in 93 (39.5 per cent.), monilial vaginitis in 13 (5.5 per cent.), soft sore in five (2.1 per cent.), and genital warts in 28 (11.9 per cent.); 49 prostitutes had two or more of these conditions. Frei and Ito tests were carried out on 163 women, the latter giving a positive result in 55 cases (33.7 per cent.) and the former in fourteen (8.5 per cent.). The social problems are discussed. It is noted that seventy of the women were married and nine were pregnant, while of 167 women questioned, 110 were illiterate.

*Eric Dunlop*

- Further Contributions concerning the Existence of Antigenic Affinities between Trachoma Agents and Agents of the Venereal Lymphogranuloma-Psittacosis Group.** (Ulteriori contributi sull'esistenza di affinità antigeniche fra gli agenti del tracoma e quelli del gruppo linfogranuloma venereo-psittacosi.) BABUDIERI, B., BIETTI, G. B., and PANNARALE, M. R. (1955). *C.R. Ist. sup. Sanit. (Roma)*, **18**, 849.
- Investigations of the Specificity of Substances in Some Human Sera which are Inhibitory in Certain Viral and Rickettsial Complement-fixing Antigen-antibody Systems.** SCHMIDT, N. J., and HARDING, H. B. (1956). *J. Bact.*, **71**, 223. 10 refs.
- Demonstration of Substances in Human Sera which Inhibit Complement Fixation in Antigen-antibody Systems of Lymphogranuloma Venereum, Psittacosis, Mumps, Q Fever, and Lymphocytic Choriomeningitis.** SCHMIDT, N. J., and HARDING, H. B. (1956). *J. Bact.*, **71**, 217. 13 refs.
- VDRL Chancroid Studies. IV. Experimental Chancroid, Prophylaxis, and Treatment.** DEACON, W. E., OLANSKY, S., ALBRITTON, D. C., and KAPLANS, W. (1956). *Antibiot. Med.*, **2**, 143. 4 figs, 2 refs.
- Importance of Chancroid in Africa.** WILLCOX, R. R. (1956). *J. roy. Army med. cps*, **102**, 15. 29 refs.
- Comparison of Repository Penicillin Treatment Schedules in Yaws in Indonesia. An Evaluation of the Epidemiological and Economical Conditions that Influence this Comparison.** [In English]. KLOKKE, A. H. (1956). *Docum. Med. geogr. (Amst.)*, **8**, 1. 7 figs, 5 refs.
- Investigation of Venereal Disease Contacts.** FIUMARA, N. J. (1956). *U.S. armed Forces med. J.*, **7**, 327. 4 refs.